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WAR DEPARTMENT

TECHNICAL MANUAL

MOTOR TRANSPORT INSPECTIONS



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WAR DEPARTMENT,
WASHINGTON, December 30, 1940.

MOTOR TRANSPORT INSPECTIONS

Prepared under direction of
The Quartermaster General

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SECTION I
GENERAL

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General.....	1
Purpose.....	2
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1. **General.**—*a.* Scheduled and regular inspections, followed immediately by any necessary corrective action, aid in keeping vehicles in operation and in maintaining the standards of quietness, reliability, and performance originally built into them.

b. The prompt detection of actual or incipient defects often prevents mechanical failure of the vehicle on the road. The units of a motor vehicle usually do not fail suddenly; they develop defects gradually and progressively. Careful inspection will detect initial failures and by arresting their development by prompt corrective action, mechanical breakdowns will be greatly reduced.

c. It is the responsibility of the officers in command of motor transport organizations to maintain all vehicles in an efficient mechanical condition and ready for operation at all times. To insure this, vehicles should be inspected systematically and periodically so that defects may be located and corrected before they become serious. These inspections should interfere as little as possible with vehicle operation.

d. A well defined system of inspection, based on the construction and mechanical characteristics of vehicles, should be initiated to fix responsibilities and insure results. When inspections are not systematized or when maintenance is neglected, vehicles deteriorate rap-

idly and minor troubles readily develop into major defects. Experience with units and parts will indicate those most likely to fail (unit and parts mortality).

e. It is obviously impossible for motor officers and mechanics to make a daily inspection of every unit, assembly, and subassembly. It is beyond the technical ability of most drivers to make detailed inspections of their vehicles at any time.

2. Purpose.—*a.* The basic purpose of motor transport inspections is to detect and remedy deficiencies in—

- (1) Mechanical condition.
- (2) Maintenance or service.
- (3) Operation.
- (4) Appearance.

b. Inspection implies a critical examination to—

- (1) Detect negligence.
- (2) Detect bad practices.
- (3) Discover indications of unit and assembly failures.
- (4) Initiate corrective action.

c. Negligence and mechanical failures in operation and maintenance are usually due to lack of knowledge, improper training, or poor disciplinary control. They are apparent to the trained inspector. Negligence in maintenance extends from minor carelessness, affecting only the appearance of the vehicle, to major errors that may result in a serious accident or take the vehicle out of service for a considerable time for repairs. Examples of major errors are—

(1) Failing to provide proper and sufficient lubricant for an engine.

(2) Neglecting to use locking devices (cotter keys, pins, or washers) when required.

(3) Neglecting to adjust brakes.

d. Faulty practices, which inspections disclose, are common to both operation and maintenance. Overloading, speeding, and driving with the foot on the clutch, known as “riding the clutch”, are common faults in vehicle operation. Lack of a definite system of inspection and failure to follow the specific maintenance instructions contained in the manufacturer’s instruction book are bad practices. Another bad practice is using a common method of lubrication for all vehicles without considering the specialized requirements specified in instruction and maintenance manuals.

e. Inspection can be considered complete only when it includes a follow-up system of corrective action. Reports and records, essential to enforcement of corrective measures, serve as useful information

for future inspections and for maintaining a chronological history of the vehicle and its repairs.

3. Technique.—*a.* The inspection of vehicles naturally resolves itself around the echelon system of maintenance. This echelonment of inspection, like the echelonment of maintenance, is limited by available technical personnel, tools, and equipment.

b. The technique of systematic inspection must include consideration of the following factors:

(1) The possibility of making inspections within a reasonable time.

(2) The value of the information produced by inspections.

(3) The simplicity of the inspections necessary to obtain desired information.

(4) The assurance that the system will provide inspection of all parts of the vehicle at proper and regular intervals.

c. The inspections outlined herein obtain effective results by considering these factors. Proficiency in the technique of inspection can only be obtained by proper training, practical experience, and by following a definite system.

SECTION II

TYPES OF INSPECTION

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4. General.—*a.* Inspections vary in nature, but the basic objective of any inspection should be to obtain a knowledge of the vehicle's condition and to insure its serviceability.

b. Motor vehicle inspections are made by different individuals at various times, so it is desirable that they be grouped and classified according to purpose and scope.

5. Organization.—Organization inspections essentially cover appearance, cleaning, lubricating, tightening, and minor adjustments. They do not normally require a detailed technical check of all units, assemblies, and subassemblies. They may be classified as command inspections and maintenance inspections, either of which may be formal or informal, scheduled or daily routine.

a. Command inspections.—(1) Command inspections are performed by responsible commanders. The commander of motorized and mechanized organizations must constantly make formal and in-

formal checks of vehicle appearance, operating conditions, tools, equipment, and garage and repair facilities. The details of inspection depend entirely upon the commander's experience and his technical qualifications.

(2) Higher commanders inspecting motorized or mechanized organizations should usually be guided by instructions in paragraph 16 covering formal inspections, and appendix II. Appendix III shows a suggested guide for use of organization commanders when an abbreviated form seems appropriate.

(3) During their inspections inquiries should be made as to—

(a) Adequate number and types of vehicles.

(b) Sufficiency, training, and capability of personnel, both for maintenance and for operations.

(c) Status and condition of motor transport supplies, tools, and equipment.

(d) Assignments and economic use of motor vehicles.

b. Maintenance inspections.—(1) Maintenance inspections are preventive in nature and primarily pertain to organizational maintenance. They are made by junior officers and noncommissioned officers of a company, battery, troop, platoon, section, or squad, in their capacities as platoon leaders, truckmasters, or carmasters, motor sergeants, chief mechanics, section and squad leaders, and specialists.

(2) Maintenance inspections are made daily and weekly to insure that the operators of the vehicles, as well as the mechanics, are performing their duties. As a check on the maintenance of companies, batteries, and similar organizations, there is a 1,000-mile (or monthly) maintenance inspection.

6. Technical.—*a.* Technical inspections are a follow-up and check on maintenance inspections. They determine whether a vehicle should be continued in service, repaired by unit replacement, or given a major overhauling. They should only be made by technically qualified commissioned and enlisted personnel, and should be considered corrective rather than preventive inspections—the latter being a definite responsibility of the operating organization.

b. Army Regulations require that detailed technical inspections usually be made by personnel of third and fourth echelon establishments once every 6 months or after 6,000 miles of operation, or whenever a vehicle is run more than 6,000 miles in a single 6 month's period. Some time must be devoted to each unit, assembly, subassembly, and part.

c. Technical inspectors should be given detailed instruction in the use of available precision tools, instruments, and test devices. They

should be sufficiently competent to note all defects and determine their causes.

d. In making a technical inspection they should examine the last technical report, W.D., Q.M.C. Form No. 260 (Technical Inspection Report of Motor Vehicles), for the vehicle about to be inspected and check what action has been taken to correct previously noted defects. Unsafe vehicles should always be placed "out of service" until repaired or disposed of either by action of higher authority or by W.D., I.G.D. Form No. 1 (Inventory and Inspection (I and I) Report). When immediate adjustments or repairs are not practicable, the facts should be recorded during the inspection and corrective action taken as soon as possible.

e. The results of these inspections are recorded on W.D., Q.M.C. Form No. 260. Appendix I amplifies an inspection procedure based on this form.

f. If a technical inspection reveals that a vehicle, unit, assembly, or part is unserviceable or cannot be used with safety, the following data on a brightly colored, medium sized tag fastened in a conspicuous place on the vehicle, unit, assembly, or part, should serve as a warning against its use. After repairs or disposition the tag should be removed.

UNSERVICEABLE VEHICLE, UNIT, ASSEMBLY, OR PART

Vehicle USA No. or description of article.....
 Make and model.....
 Organization.....
 Date.....
 Authority.....
 Summary of defects.....

 Remarks.....

 Signature of inspector

 (Date)
 Defects corrected:
 (Tag removed for record.)

 (Signature)

7. Special.—a. These inspections are intended to cover unusual conditions and situations not included in either a technical or non-technical inspection.

b. They are performed as directed when occasion demands, and may cover—

- (1) Road conditions.
- (2) Terminal areas.
- (3) Road circuits.
- (4) Cargo handling facilities.
- (5) Accidents.
- (6) Any other factors involved in efficient operation or maintenance.

SECTION III
NEW VEHICLES

General.....	Paragraph 8
Breaking- (running-) in.....	9

8. General.—a. Before a new vehicle is placed in service it should receive a thorough inspection to determine whether all parts are properly in place, adjusted, and capable of performing their mechanical functions. The engine, chassis, power transmission units, and other assemblies of the vehicle should be thoroughly checked, and if necessary, adjusted and lubricated. The cooling system and storage battery must be inspected for water level and tires checked for air pressure.

b. The manufacturer's operation and maintenance manual should be used as a reference for lubrication and for details of the "check up" inspections of the vehicle.

9. Breaking- (running-) in.—a. It is desirable that each new vehicle be "broken-in" for at least 500 miles under close supervision of competent personnel for the purpose of discovering defects in functioning of parts, minimizing damage from frictional heat induced by the close fit of new parts, and "limbering up," because a vehicle is inherently stiff when new.

b. A new vehicle should be checked for completeness of equipment, brake adjustment, wheel alinement, and for other factors affecting safe and economical operation before it is placed in service. The engine should contain the "running-in" lubricant recommended by the manufacturer. The crankcase must be drained and refilled (usually after the first 500 miles of operation) in accordance with the vehicle manufacturer's instructions. The ignition, timing, and carburetor adjustment should not be changed during the "breaking-in" period except when necessary and then only by technically qualified personnel.

c. Vehicle speed during the "breaking-in" should not exceed that specified by the manufacturer, usually 25 to 35 miles per hour.

Speed should be increased gradually from minimum to maximum during the first 1,500 miles. Upon completion of the "breaking-in" period the vehicle should again be thoroughly inspected and adjusted before it is released for regular operation. A vehicle can be more thoroughly broken-in by driving it during the required running-in period for long and continuous runs of at least 100 miles at a time.

d. Where applicable, the inspection and adjustment routine during "breaking-in" should generally include the following:

(1) *Engine.*—(a) Tighten cylinder head bolts (use of a torsion or torque indicating wrench is extremely desirable to obtain uniform pressure).

(b) Check and adjust valve clearances.

(c) Check spark plug gaps.

(d) Clean and adjust distributor breaker points and check timing.

(e) Tighten joints of intake and exhaust manifold.

(f) Check carburetor and controls.

(g) Check and adjust fan belt.

(h) Check engine lubrication.

(2) *Cooling system.*—(a) Inspect and tighten hose connections.

(b) Check and adjust water pump packings.

(3) *Fuel system.*—Inspect tanks, lines, and pumps for leaks.

(4) *Instruments and lights.*—(a) Check operation of horn and windshield wiper.

(b) Check lights and directional signals.

(c) Check control buttons and instruments on panel in cab, or operator's compartment.

(5) *Front end.*—(a) Inspect wheels for correct caster, camber, and toe-in.

(b) Tighten spring clips and adjust shackles.

(c) Check tie rod and steering arm assembly.

(d) Check lubricant in front axle housing (driving axles only) for quantity and for leaks.

(6) *Rear end.*—(a) Tighten spring clips and adjust mounting.

(b) Check lubricant in rear axle housing (driving axles only) for quantity and for leaks.

(7) *Transmission and transfer case.*—Check lubricant in cases (or housings) for quantity and for leaks.

(8) *Wheels and brakes.*—(a) Tighten rim lugs or wheel stud cap nuts.

(b) Inspect tires for indications of excessive wear, proper mounting, and correct inflation.

- (c) Check wheel bearings for adjustment and lubrication.
- (d) Check and adjust brake linkage and linings. In hydraulic brake systems, check for fluid leakage.
- (9) *General.*—(a) Check clutch pedal clearance.
- (b) Fill battery with distilled water; clean and tighten all electrical connections.
- (c) Check generator.
- (d) Check starting motor.
- (e) Tighten all loose bolts.

SECTION IV

VEHICLES IN STORAGE

Vehicles in storage-----	Paragraph 10
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10. Vehicles in storage.—Inspection of motor vehicles in storage should be made monthly. All vehicles that have been out of service and in “dead storage” for more than 2 weeks should also be inspected. Current regulations prescribe the procedure. Inspection should include a physical check of all vehicles not in operation or in the repair shop to see that regulations have been complied with and that vehicles have not been stripped of their parts, units, assemblies, or sub-assemblies. It is an exceptionally bad practice to permit removal of units and parts from vehicles in storage. Military motor vehicles in storage should be in sufficiently good condition to be used on comparatively short notice and with a minimum of servicing.

SECTION V

RECLAMATION AND SALVAGE

Classification and marking-----	Paragraph 11
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11. Classification and marking.—*a.* When a vehicle is received in the reclamation department for reclamation of component parts, it is sent to the wash rack for a thorough cleaning. After the return of the vehicle from the wash rack it is dismantled, and the parts and units are sent to an inspector, who examines each part for serviceability or possibility of repair.

b. After inspection, parts and units are marked, by the inspector responsible, with colored paints to indicate disposition.

(1) White paint indicates serviceable parts and units, usable at once, which are sent to stock for reissue.

(2) Blue paint indicates minor repairs to unserviceable parts and units economically repairable, which are repaired and sent to stock.

(3) Red paint indicates major repairs to unserviceable parts and units economically repairable, which are repaired and sent to stock.

(4) Yellow paint indicates uneconomically repairable parts and units, which are sent to the salvage officer for disposition as "waste" or "junk" material.

(5) Green paint indicates nonstandard parts and units, which are disposed of in accordance with existing instructions.

c. Inspectors should be especially trained to make careful inspections of motor transport vehicles, units, and parts which are to be salvaged. Indifferent, careless, or improperly trained inspectors who allow good parts and units to be junked or otherwise disposed of are acting to the detriment of the best interests of the service by nullifying the efforts of the reclamation department. Unserviceable parts sent to the warehouse occupy valuable space and, when reissued, will be found unsuitable for a first class repair job. They will have to be returned to the reclamation department, and if the same inspector is still on duty, this cycle of inefficiency may be repeated.

d. Inspectors should specifically note and report parts that show a noticeable lack of care or faulty operation in order that corrective action may be taken.

SECTION VI

ORGANIZATIONAL INSPECTIONS

	Paragraph
First echelon (driver's)-----	12
Second echelon-----	13

12. **First echelon (driver's).**—*a. General.*—This type of inspection is continuous for the period the driver is assigned to a vehicle. He must constantly be on the lookout for any defects that may develop and must take corrective action at once, or report conditions to his immediate superior. The driver's inspection is naturally divided into three groups:

- (1) Inspection prior to starting the vehicle.
- (2) Inspection during operation of the vehicle.
- (3) Inspection after operation (or before vehicle is parked or put away).

b. Inspection prior to starting.—A motor vehicle should never be considered in condition to take the road until definite inspections have been made by the driver, who will be held strictly responsible for their performance. The driver must check the following:

- (1) *Before the engine is started.*—(a) Water in the radiator.
- (b) Gasoline in the tank. If there is no fuel gage, or if it is inoperative, a measuring stick should be used.

- (c) Lubricating oil in the crankcase.
- (d) Reserve lubricating oil necessary to complete the trip.
- (e) Tire pressure, including any spares.
- (f) Ground under the vehicle for leaks. If there is a leak it should be located and corrected.
- (g) Necessary equipment and tools.
- (2) *After the engine is started.*—(a) Loose parts or units.
- (b) Ammeter to see that it is functioning.
- (c) Oil gage or indicator for proper pressure.
- (d) Engine for unusual sounds or noises.
- (e) Air compressor gage and governor for correct functioning.
- (f) Lights, horn, and windshield wiper.
- (3) *Immediately after the vehicle is moving under its own power.*—
- (a) Action of the steering mechanism.
- (b) Action of the clutch.
- (c) Action of power transmission units.
- (d) Action of the brakes.

In addition to the foregoing, the driver should perform all daily routine lubrication unless such lubrication is assigned to special details. The time required to make this inspection is normally less than 5 minutes. When complete lubrication is necessary, it should not exceed 1 hour.

c. Inspection during operation.—(1) Inspection during operation is continuous. The driver when operating his vehicle must always be on the alert to detect unusual noises or imperfect action of vital safety or mechanical units.

(2) At intervals during a day's work when dispatched on an individual trip ticket, the driver must examine his vehicle to determine whether any parts are working loose or have become unserviceable. If he notes anything that he cannot promptly remedy, he should report it to his immediate superior or to the dispatcher on duty.

(3) The following inspection should be made at intervals en route:

- (a) Walk around the vehicle looking carefully for fuel, water, brake fluid, and lubricant leaks.
- (b) Inspect tires for cuts and breaks, or for improper inflation.
- (c) Verify the amount of fuel in the tank.
- (d) Check the quantity of water in the radiator.
- (e) Look at front axle, steering gear, and other assemblies for loose or hanging parts.
- (f) Unless temperature gage is working and reads "normal," feel engine block and radiator to see if the engine is overheating.
- (g) Listen to the engine to detect unusual sounds.

(h) Feel brake drums for excessive heat and examine the brake linkage for lost, loose, or broken parts.

(i) Check those units, particularly the engine, that may require the addition of a lubricant during the day.

(4) If all drivers are taught to appreciate the importance of performing these inspections conscientiously, practically all break-downs will be prevented, except, of course, those resulting from unusual conditions or defective material. The driver must be taught to recognize odd and peculiar noises made by his vehicle and to realize that they indicate abnormal conditions.

d. Inspection after operation.—(1) At the conclusion of each day's march, or upon completion of a day's work when dispatched on an individual trip ticket, the driver must make an inspection of his vehicle before putting it away. This inspection should be daily routine. Defects or any abnormal condition which cannot be corrected by the driver must be reported to his immediate superior or to the dispatcher on duty, who should initiate corrective action. The driver should—

(a) Inspect fuel, water, brake fluid, and lubricant for leaks.

(b) Check tires for cuts, breaks, and improper inflation.

(c) Inspect for lost parts (grease fittings, hub, and radiator caps, etc.) and for loose bolts, nuts, and other fastenings.

(d) Check tools and equipment.

(e) Service the vehicle, that is, replenish fuel, engine lubricant (oil), water, and other necessary operating supplies.

(2) After making this check the driver should note anything unusual that may have occurred during the day, with particular reference to—

(a) Engine overheating, knocking, or missing.

(b) Defective brakes.

(c) Unusual noises.

(d) Clutch or transmission trouble.

(e) Abnormal operation of oil and temperature gages.

(f) Ammeter and other instruments registering improperly.

(g) Flat tires.

(h) Defective lights or electrical troubles.

(i) Loss of tools, equipment, or cargo.

13. Second echelon.—*a.* These inspections are basically concerned with preventive maintenance. They prolong vehicle life, give reasonable safety and certainty in operation, and detect minor defects before they develop into major troubles. The details to be covered depend upon the technical knowledge of the inspector, the

availability of tools and equipment, and the objective of the inspection.

b. In addition to detecting and correcting defects in the early minor stages, the second echelon maintenance inspections should include a daily check of vehicles noting the following:

- (1) Steering mechanism and linkage.
- (2) Effectiveness of the braking system.
- (3) Proper functioning of horn and other warning devices or signal equipment.
- (4) Functioning and effectiveness of the vehicle's lighting system.
- (5) Other equipment such as fire extinguishers and windshield wipers.

The above items are considered essential factors in the safety of each vehicle and in minimizing hazards to life and limb.

c. Tools and equipment authorized for second echelon activities are listed in current Tables of Basic Allowances. These tools are illustrated in Circular No. 4, office of The Quartermaster General, current series. AR 850-15 and Circular 1-10, office of The Quartermaster General, current series, limit the scope of work that should normally be performed by this echelon. Based on this, inspection work should be limited to determining unserviceability and the nature of the repairs required. Usually the second echelon should not tear down units, assemblies, or subassemblies and should only determine whether minor repairs are necessary or whether the entire unit is to be replaced. Exceptions to this rule can and must be expected. However, each exception must be solved on the basis of existing conditions. The factors involved usually include time; availability of parts, supplies, tools and equipment; repair facilities; and the technical ability of the personnel to perform the work.

SECTION VII

SERVICE INSPECTIONS

	Paragraph
Third echelon-----	14
Fourth echelon-----	15

14. **Third echelon.**—*a.* Third echelon inspections are a follow-up and a check on the second echelon's performance of its duties. They usually should be more detailed and technical than a second echelon inspection, and should determine whether a vehicle is to be continued in service or withdrawn for replacement of units and assemblies or for major repairs.

b. Third echelon replacements and repairs should only be made when the general condition of a vehicle indicates a possible future service (after repairs are made) commensurate with the amount of work to be done and the costs involved. If economical repairs are impracticable, the vehicle should be disposed of as directed by higher authority or should be sent to a fourth echelon shop to be salvaged or to have its component parts reclaimed.

c. Technical inspections by third echelon personnel are required once every 6 months or after 6,000 miles of operation. After the defects have been determined, necessary corrective action should be taken as soon as possible or the vehicle should be disposed of if it is beyond economical repair.

d. When the third echelon effects repairs by "Unit Replacement," new or repaired units and assemblies should not be installed with badly worn parts, units, and assemblies. This general rule must not be violated except in an emergency and then only when the replacement does not affect safe operation of the vehicle.

e. Third echelon inspections should be recorded on W.D., Q.M.C. Form No. 260 (see App. I).

15. **Fourth echelon.**—*a. General.*—(1) Fourth echelon inspections are considered the highest type of motor transport technical inspection.

(2) A fourth echelon establishment with its "tear down" and "overhaul" work is afforded a better opportunity than other echelons to examine, internally as well as externally, all units, assemblies, subassemblies, and parts of a motor vehicle. By the use of more elaborate test equipment, more varied assortment of tools and machinery, and more skilled personnel, it is able to determine conditions on a better and more definite basis than the speculative basis used of necessity by the lower echelons.

b. Inspectors.—(1) An inspector of the fourth echelon activity should be technically above average. He should have had practical production and operation experience in the particular type of work he is performing. As a fourth echelon inspector he may be called upon to check and determine all details in connection with work on engine overhaul, carburetors, and electrical units, heavy units and chassis rebuilds, or he may be required to act as an inspector receiving or shipping parts, tools, supplies, and equipment, or in receiving raw materials for manufacturing purposes. A good inspector must have the knowledge and the ability to make decisions promptly and to carry out announced policies, orders, and instructions impartially. He should change his mind only when convinced

that such is necessary to the best interests of the service. His decisions, made in accordance with policies and instructions, should be final. Appeals concerning them should be made only to his immediate superior, the chief inspector.

(2) Regardless of an inspector's previous experience and training, he must be carefully instructed in the details of procedure and in the methods used in the particular activity to which he is assigned. His work must be coordinated with that of all other inspectors in the establishment to insure standardization and quality. He must be promptly instructed regarding changes in acceptable standards.

(3) Inspectors must be impressed with the idea that criticism of work without corrective recommendations or suggestions is destructive. Quality of workmanship and safety must be constantly impressed upon all inspectors.

c. Purpose.—(1) The purpose of fourth echelon inspection is the technical examination of all automotive supplies from the raw material stage to the finished product, including overhauled or rebuilt vehicles.

(2) It guards against mistakes, whether they are accidental, due to careless workmanship, or errors in judgment. It maintains the quality of production. It examines and passes judgment during each and every step of work.

d. Scope.—Fourth echelon inspections are divided into three general groups, receiving (or supply), progressive (or departmental), and final test. The details of inspection in any fourth echelon establishment depend upon the type of work being done. In shops, particularly those with motor supply depot activities, it is usual to organize an inspection branch directly responsible, through a chief inspector, to the commanding officer. This branch inspects or is responsible for:

(1) All supplies, vehicles, units, assemblies, and subassemblies received by the supply division.

(2) All work as it progresses through the various departments of the establishment.

(3) All finished work.

(4) All reclamation and salvage work.

(5) Diagnosing repairs and initiating the necessary work orders.

(6) Final approval of all move orders sending work from one department to another.

(7) Editing shop requisitions, particularly to avoid requisitioning new parts when old ones will meet standards.

(8) Reports on shop supply functions, production methods, security, or other special features directed by the commanding officer.

e. Receiving (or supply) inspection.—(1) This inspection has a twofold purpose: inspection of all raw materials, parts, supplies, and other articles received for stock or for shop work, and inspection of all vehicles, units, assemblies, and other articles sent in for repairs.

(2) When raw materials, parts, supplies, and other articles have been inspected and have met specifications, the result of the inspection is recorded and the record is signed by the inspector responsible. The articles are then sent to the warehouse for storage or for issue to the shops.

(3) Receiving inspector, when necessary, routes articles for salvage, reclamation, manufacture, or special and miscellaneous work.

(4) When vehicles, units, assemblies, and similar articles are received for repairs, and after the extent and details of necessary repairs are determined by inspection, a job (or work) order is prepared to cover each vehicle, unit, assembly, or part, and they are sent to the proper department of the maintenance division. A vehicle is sent to the chassis bay for removal of units and assemblies which are then sent by move orders to the departments that are to do the work.

(5) In receiving shipments, the inspection branch does not maintain any property or other records. It uses the blank forms prescribed in the "Regulations Governing Industrial Activities at Motor Repair Shops of the Quartermaster Corps," June 30, 1933, as issued by The Quartermaster General.

f. Progressive (or departmental) inspections.—(1) Progressive inspections are made by personnel of the inspection branch assigned to various departments of a motor transport repair shop (fourth echelon). The inspectors follow the units, assemblies, or subassemblies through each department or departments, examining the work being done and checking their methods and procedure.

(2) These inspections are constant. They involve detailed precision measurements, checks for exact fit of parts, and examinations for excessive wear, flaws, and defects in materials.

(3) After department foremen prepare requisitions for parts, the departmental inspector checks the requisition to prevent duplication of cost charges and parts on the same job order and to avoid accumulation of excess parts in the department.

(4) In the chassis bay (assembling) department all vehicles are disassembled. Unserviceable units, assemblies, and subassemblies are inspected and either sent to the reclamation department, transferred to another department, or repaired and adjusted by chassis bay per-

sonnel. If replacements are available, the chassis bay obtains them from the supply division and installs them. If replacements are not available, other departments concerned are called upon to return the repaired articles to the chassis bay, where they are replaced on the vehicle.

(5) After repairs to individual units, assemblies, and subassemblies have been satisfactorily completed in any department of the shop, the responsible inspector signs the move order transferring them to another department, the chassis bay for reinstallation upon the vehicle from which originally removed, or if they are not required for the repair of a vehicle in the shops, to the proper warehouse of the supply division.

(6) In the engine assembly department all work performed upon each individual engine is inspected and checked during all stages of assembly. When completely assembled and passed as satisfactory by the inspector, the engine is placed on the dynamometer test stand. This dynamometer, operated electrically, cranks the engine until all of its parts are loosened up and limber. A compression test is made of the engine and if satisfactory the engine is then run under its own power in the test stand until all moving and working parts have been sufficiently broken-in to avoid overheating. The engine, still on the dynamometer test stand, is then tested by electrically measured resistance to determine its ability to attain its rated horsepower.

(7) If the horsepower test is successful, the engine is passed by the inspector and all necessary engine accessories are mounted. It then goes to the paint shop. After painting, it is transferred to the chassis bay for installation in a vehicle or to the warehouse of the supply division for stock.

(8) If the engine fails to pass the dynamometer test, it is returned to the engine assembly department for correction of defects and it is tested again and again, until it does pass satisfactorily.

(9) In the allied trades department, all heavy, sheet metal, wood working, and upholstery repairs are made. Progressive inspections are made in this department by assigned inspectors.

(10) Despite the fact that the repaired vehicle and its units have been inspected during its progress through the shops, the completed vehicle is turned over for final test.

(11) In salvage and reclamation work, vehicles, units, assemblies, and subassemblies are taken apart and examined. The articles that are reclaimable are moved to the proper shop department for necessary work or repair and returned to stock for future use. Those beyond economical repair are disposed of as prescribed in existing regulations as salvage.

g. Final test inspections.—(1) These inspections provide a final road test after the reassembled vehicle is received from the chassis bay. Before going on the road the inspector in this subdivision checks and makes any necessary tuning-up adjustments. The road test should involve actual operation over rough, hilly, and normal terrain for a distance of at least 10 miles; 20 to 50 miles are preferable. Tactical or strategical conditions may dictate a shorter road test, but every effort should be made to provide at least a 10-mile test.

(2) Should the vehicle fail during the road test, it is returned to the chassis bay with a written report. After defects have been corrected and the vehicle passes the final test successfully, the inspection branch transfers it to the supply division as ready for issue (R.F.I.).

(3) In addition to the road test, this inspection—

(a) Checks appearance, and makes certain that all repainting has been properly done. This examination should be made in the open, preferably in the sunlight; bad lighting can make poor paint work look satisfactory.

(b) Checks all repairs listed on job (work) order to assure that all work has been done.

(c) Checks completeness of accessories and equipment.

(d) Examines all gages and instruments to see that they are working properly.

(e) Examines, checks, and adjusts all safety items, especially steering, brakes, horn, lights, windshield wipers, etc.

(4) The standards required by the final test must be adopted with consideration of the service needs, but must always insure that a vehicle when released for issue is safe to operate and capable of performing satisfactorily.

SECTION VIII

INSPECTION PROCEDURE

	Paragraph
Formal (command)-----	16
Informal-----	17
Technical-----	18
Inspection forms-----	19

16. Formal (command).—*a.* The following outline will facilitate the making of a formal command inspection:

(1) Organization or organizations to be inspected in formation with all personnel at definite posts in the vicinity of their respective vehicles, squads, sections, platoons, or companies.

(2) All tools and equipment displayed in a uniform manner, usually directly in front of the vehicle.

(3) All engine hoods or panels should be raised to show the engine.

(4) All seat cushions should be raised to show their bottoms and sides, and to reveal the compartments underneath.

(5) All tool boxes, receptacles, and containers should be open to show interiors.

(6) Tail gates should be lowered.

(7) Doors of cabs (drivers' compartments) should be open.

(8) Batteries should be exposed for inspection.

(9) All drivers should be posted at the left side of their vehicles, near the front bumpers.

b. Routine military formations should be used for formal inspections according to terrain and special conditions.

c. The inspector should inquire about driver's ability to handle his vehicle, and whether he holds a U. S. Army Motor Vehicle Operator's Permit (W.D., Q.M.C. Form No. 228), which is issued after an examination and test.

d. Tools, equipment, and kit should be checked as to type, quantity, and condition.

e. A general check of absent vehicles should be made to determine their status and whether the delay in returning vehicles to service is due to lack of proper supervision and follow up, lack of maintenance personnel, faulty requisitioning, or failure of supply agency to meet demands.

f. The inspector may require the driver to start his engine and note the ease with which it starts, its action after starting, and its quietness. Action of the engine governor, with throttle wide open, should be noted. Governor should be checked for evidence of tampering. Excessive engine vibration, that might be due to loose bolts or defective engine mountings, should be noted.

g. Tires should be examined for improper inflation and for indications of excessive wear from incorrect wheel alinement.

h. Appearance and cleanliness of the vehicle should be noted.

i. Less accessible units and parts should be selected at random and examined for cleanliness, loose bolts, nuts, rivets, connections, and parts.

j. Particular check should be made for lack of protective paint on places not normally exposed to view. Rust, which forms on unpainted or scratched surfaces, can be readily detected.

k. In making a technical inspection in formation, the inspector should be guided by the relevant instructions contained in paragraphs 6, 13, 14, or 15.

17. Informal.—*a.* Informal inspections are continuous and are made by all personnel charged with supervision and responsibility in a motorized or mechanized organization. They vary from a quick glance to observe the general appearance of a passing vehicle, to a general check to note driver's performance of first echelon duties, or to an inspection of records.

b. Unit commanders will make such informal inspections, when necessary, to maintain the efficiency of the organization and its ability to meet the demands of all service conditions and emergencies.

18. Technical.—*a.* The technical inspector should have a clerk to record the results of his inspection on W.D., Q.M.C. Form No. 260. The driver of the vehicle and a mechanic, preferably the chief mechanic, should assist.

b. If the vehicle is not cleaned immediately before the inspection, and is left dusty and dirty, oil and water leaks, cracks and similar defects may be more easily discovered.

c. To prepare a vehicle for technical inspection, the driver should—

- (1) Open or remove engine hood or panel covers.
- (2) Remove cab floor boards.
- (3) Remove engine valve cover plates.
- (4) Uncover battery and remove cell plugs.
- (5) Lay out tools and equipment.

d. Certain points cannot be settled without a driving or road test. These are—

- (1) Smoothness of clutch engagement.
- (2) Brake action.
- (3) Steering control.
- (4) Noises that are unusual or definite which indicate incipient trouble, such as gear whines and howls, rattles, and squeaks due to abnormal friction or lack of lubrication.

e. The order followed in making technical inspections should be that indicated by the numerical order listed in W.D., Q.M.C. Form No. 260 (see app. I). Variations to meet actual conditions may be necessary during the inspection. Units and parts found satisfactory should be checked on the form. Defects requiring only minor repairs or adjustments should be marked by a single cross (X) and remedied as soon as practicable. Defects requiring major repair or unit replacement, or the services of a higher repair echelon, should be marked with a double cross (XX), and noted in detail on this form under "Repairs Required (Explanation)."

19. Inspection forms.—*a.* W.D., Q.M.C. Form No. 260 is the standard and official form for recording inspections of all motor ve-

hicles, including combat vehicles of the Ordnance Department. Appendix I, an amplification of this form, shows its practical application.

b. A guide for use of senior officers in making inspections of motorized or mechanized organizations is shown in appendix II.

c. When the use of W.D., Q.M.C. Form No. 260, with all of its details, appears unpractical, inadvisable, or is not required by existing regulations, an abbreviated form for informal use, shown in appendix III, may be used.

d. Other check-up forms included in this technical manual are—

- (1) Appendix IV—Hard starting.
- (2) Appendix V—Sluggish motor.
- (3) Appendix VI—Run-down battery.
- (4) Appendix VII—Poor mileage.
- (5) Appendix VIII—Overheating.
- (6) Appendix IX—Battery inspection record.
- (7) Appendix X—Inspector's report on vehicles dispatched daily.

e. A suggested schedule of organizational (preventive) inspections is shown in Appendix XI.

f. The forms referred to in the appendixes, with the exception of W.D., Q.M.C. Form No. 260, are merely intended as guides. They should aid in the details of inspection and can be altered to suit local conditions or instruction purposes. The extent to which use is made of these forms depends entirely upon the technical ability of available personnel, the time factor, and the test and shop equipment available.

APPENDIX I

PRACTICAL APPLICATION—W.D., Q.M.C. FORM NO. 260
(RECORDING A DETAILED TECHNICAL INSPECTION)*External inspection***1. Bumpers.**

- a.* Stand in front of truck.
- b.* Examine front bumper for straightness.
- c.* Use wrench to test bolts on right and left sides of bumper for looseness.
- d.* Go to rear of vehicle.
- e.* The two wooden blocks, usually iron covered, at the end of the frame are the rear bumpers.
- f.* Examine blocks to see if wood is broken.
- g.* Use wrench to test for looseness the bolts that fasten bumpers to brackets and brackets to frame.
- h.* Inspect brackets for breaks.

2. Boards, running.

- a.* Go to left side of cab.
- b.* Immediately below the door is the left running board.
- c.* Examine for dents and cracks.
- d.* Shake board up and down to test for looseness.
- e.* Examine under side of board for breaks at brackets attaching running board to frame.
- f.* Go to right side of cab and inspect the right running board in the same manner—Repeat *c* to *e*.

3. Body.

- a.* Walk along right side of body, inspecting all brackets thereon.
- b.* Inspect for breaks, dents, and broken welds along body side; examine under side of body for dent or broken sills and broken welds.
- c.* Stop at rear of vehicle and check lowered tail gate. (See item 11 *b* and *c*.)
- d.* Examine floor of body.
- e.* Go to left side of body and inspect—Repeat *a* and *b*.

4. Bows (and ridge pole).

- a.* Enter body at the rear and inspect the bows.
- b.* Test all bolts and nuts at ridge pole (the ridge pole is located along the center of the bows overhead).
- c.* Inspect the bows and ridge pole for breaks.

- d.* Inspect the troop seats, located on both sides of the inside of the body, for breaks, bent legs, broken brackets, and broken pins.
- 5. Camber.**—Does not pertain to organizational echelons of inspection. Normally a third or fourth echelon function.
- 6. Carrier, tire.**
 - a.* Go to the front left (and/or right) side of the vehicle.
 - b.* Inspect spare tire for serviceability.
 - c.* Shake wheel to check for looseness.
 - d.* Use wrench to test bolts (wheel to bracket and bracket to cab or support).
 - e.* Inspect bracket at frame support.
 - f.* Use wrench to test bolts (bracket to frame).
- 7. Caster.**—Does not pertain to organizational echelons of inspection. Usually a third or fourth echelon function.
- 8. Curtains.**
 - a.* Walk around body, inspecting tarpaulin and end curtains for tears and rips.
 - b.* Inspect tie down ropes.
- 9. Doors.**
 - a.* Go to right side of cab.
 - b.* Open and close door to test for fit.
 - c.* Shake door up and down while open to test for loose hinges.
 - d.* Inspect door lock by turning door handle and checking catch.
 - e.* Test hinge screws with screw driver.
 - f.* Inspect inside door panel for missing screws.
 - g.* Inspect inside door handles.
 - h.* Open and close door glass.
 - i.* Test all screws on door.
 - j.* Inspect check strap at front of door.
 - k.* Go to left side of cab and inspect left door—Repeat *a* to *j*.
- 10. Fenders.**
 - a.* Inspect left front fender for breaks and dents.
 - b.* Shake fender up and down to test for looseness.
 - c.* Inspect brackets under fender for bends or breaks.
 - d.* Use wrench to test bolts (fender brackets to frame and fender to bracket).
 - e.* Go to right front fender and inspect—Repeat *a* to *d*.
 - f.* Go to right rear fender and inspect for breaks and dents.
 - g.* Inspect welds (fender to body).
 - h.* Go to left rear fender and inspect for breaks and dents.
 - i.* Inspect welds (fender to body).

11. Gate, tail.

- a.* Go to rear of body and inspect tail gate for dents or breaks.
- b.* Inspect tail gate chains and brackets located at each end of tail gate.
- c.* Inspect tail gate hinges.

12. Glass.

- a.* Go to right door of cab.
- b.* Open door and inspect door glass.
- c.* Inspect windshield glass.
- d.* Inspect glass in rear of cab.
- e.* Go to left door and inspect glass.
- f.* Inspect rear vision mirror.

13. Guards, headlamp.

- a.* Shake to determine looseness.
- b.* Inspect for breaks, fractures, and appearance.

14. Guard, radiator.—If separate, inspect same as Item 13.**15. Hood.**

- a.* Examine left side of hood for dents.
- b.* Unfasten hood fastener and lift hood, examining fastener and hood hinges.
- c.* Examine hood lacing for breaks or frayed places.
- d.* Lower left side of hood.
- e.* Go to right side and examine right side of hood for dents; unfasten right hood fastener and lift hood, examining fastener and hood hinges.
- f.* Examine hood lacing for breaks or frayed places.

16. Hooks, tow.

- a.* Tow hooks are located immediately behind the front bumper on the right and left frame members.
- b.* Inspect right hook for straightness and with wrench test the bolts (hook to frame).
- c.* Inspect left hook for straightness, and with wrench test the bolts (hook to frame).

17. Lights.

- a.* Open door of cab and turn light switch, usually located on the instrument panel, to the "on" position.
- b.* Go to front of vehicle and inspect lights to see if they are burning.
- c.* Inspect headlamps for broken glass and dirty reflectors.
- d.* Shake to see if parts are loose.
- e.* Inspect wire connection at rear of headlamps.
- f.* Test with wrench the headlamp bracket bolts.

- g. Go to left rear of vehicle and inspect taillamp—see if it is burning, inspect for broken glass and dirty reflector, shake lamp to see if it is loose, inspect wire connection, test the bolts which attach taillight bracket to body.
- h. Check operation of stop light and directional lights.
- i. Check operation of headlamp dimmer or beam depressor switch.
- j. Turn off headlamps.

18. Paint.

Walk around vehicle and inspect the paint, looking for chipped paint, rust spots, scratches, peelings, and cracks.

19. Pintles.

Go to rear of vehicle and inspect pintle (towing device), which is located at the center of the rear cross member between the rear bumpers. (Most vehicles are equipped with pintles.)

20. Radiator.

- a. Go to front of vehicle and inspect radiator grill and radiator.
- b. Look under vehicle to see if there are any water leaks.
- c. Lift hood on right side and examine rear side of radiator for leaks, rust, corrosion, or plugging of air passages.
- d. Shake radiator to see if it is loose in the frame.

21. Tires.

Inspect tires for serviceability in the following order: right front and rear tires, left rear and front tires. Look for indications of improper inflation or use. Cuts, blisters, breaks, curb chafing, and similar defects should be recorded for each tire.

22. Top.

Step up on left running board and inspect top of cab. Look for indication of leaks or breaks in material.

23. Toe-in.

- a. Inspect front tires for excessive and uneven wear.
- b. Have mechanics with proper instruments check for proper alignment the front wheels of any vehicle with unevenly worn tires.

24.

25.

Hood up (engine stopped)

26. Antifreeze.

The antifreeze solution in the radiator must be tested with a hydrometer in winter months, but it is not necessary when weather conditions do not require use of an "antifreeze."

27. Assembly, breaker points.

- a. Lift the proper side of the hood.
- b. Remove the distributor cap by releasing the catches on the side and lifting off the cap.

- c.* Lift the rotor from the center shaft.
 - d.* Take one finger and pull back the end of the breaker arm thereby separating the points.
 - e.* Inspect the points for pits and burns. (Points badly pitted or burned should be refaced or replaced.)
 - f.* Inspect inside of distributor cap and distributor for cleanliness.
 - g.* Reinstall rotor and distributor cap, making sure that all spark plug wires are pushed well into the cap.
- 28. Baffles, intercylinder.**—(For ordnance vehicles.)
- 29. Battery.**
- a.* Inspect water level in battery, making sure the water is at least $\frac{1}{2}$ inch above battery plates.
 - b.* Replace plugs. Inspect battery terminals for corrosion and looseness. Make sure these terminals are clean and greased with a light grease, such as petroleum or vaseline.
- 30. Belt, fan.**
Inspect fan belt, making sure this belt has approximately $\frac{1}{2}$ -inch play. (If fan is gear driven, check for play and lash.)
- 31. Cleaner, air.**
- a.* The air cleaner, as a rule, is located over the carburetor.
 - b.* Remove the cover.
 - c.* Remove the cleaning element from the inside and examine for cleanliness.
 - d.* Inspect to be sure there is proper quantity of oil in bottom of cleaner (oil bath type).
 - e.* The cleaner should be washed, if dirty. Clean oil supply usually is required for oil bath type.
- 32. Compressor, air.**
- a.* Inspect this unit for leaks and unusual noises.
 - b.* Check air pressure control governor device for proper setting and functioning.
- 33. Engine, oil.**
- a.* The oil level bayonet gage is usually located on the left side of the engine.
 - b.* Pull out bayonet gage and wipe it clean.
 - c.* Reinsert bayonet gage and remove it a second time. Check oil level as shown by marks.
 - d.* Inspect the oil for cleanliness and body.
 - e.* Oil that is black or thin should be changed.
 - f.* Replace bayonet gage.

- 34. Fan, cooling.**
- a.* Fans are normally located in front of engine (behind the radiator).
 - b.* Inspect blades for breaks, looseness, and proper pitch.
 - c.* Shake fan to test for looseness and worn bearings.
- 35. Filter, fuel.**—If external, inspect this unit in a manner similar to Item 36. If part of a sediment bowl, inspect screen and bowl for dirt (see item 44).
- 36. Filter, oil (external).**
- a.* The oil filter may be mounted on the dash or on the engine.
 - b.* Inspect the oil lines for leaks. Note the number of miles since filter was installed. (Mileage at time of installation of filters should be noted on filters or in records.)
 - c.* The filter should be changed or cleaned at least every 8 to 10,000 miles.
- 37. Filter, oil (in engine).**—(For ordnance vehicles.)
- 38. Fluid, brake.**—Inspect at master cylinder. Check for—
- a.* Quantity.
 - b.* Contamination by dirt, grit, and foreign substances.
- 39. Governor, seal.**
- a.* The governor, as a rule, is located between the carburetor and the intake manifold on the side or top of the engine.
 - b.* Inspect the adjusting screws. Note if seals are intact.
 - c.* Inspect the nuts, holding the carburetor to the governor.
 - d.* Seals should be in good shape and wires not broken.
- 40. Housing, steering gear.**
- a.* Leaving left side of hood raised, reach through left door and turn steering wheel back and forth.
 - b.* Watch the steering housing at frame to see if there is any looseness.
 - c.* Use wrench to test bolts fastening steering gear housing to frame.
- 41. Pump, water.**
- a.* Leaving hood raised, examine the water pump.
 - b.* Inspect for water leaks at packing nut.
 - c.* Inspect fitting for lubrication.
 - d.* Check for end play in shaft.
- 42. Shroud, engine.**—(For ordnance vehicles.)
- 43. Spark plugs.**
- a.* Spark plugs are located along the side or top of the engine.
 - b.* Inspect to see that porcelain is clean and that there are no oil leaks around the bases of plugs.
 - c.* Inspect porcelain for cracks.

- d.* Check with spark plug wrench to make sure all spark plugs are tight.
- e.* Make sure all terminals and caps are tight.
- 44. Strainer, fuel pump.**
 - a.* The fuel pump, as a rule, is located low and on the side of the engine.
 - b.* Inspect the glass bowl on the pump to see if it contains any sediment or dirt.
 - c.* Remove glass bowl and screens; clean them.
 - d.* Inspect all gas lines at fuel pump for leaks.
- 45. Strainer, scavenger oil.**—(Usually on ordnance vehicles.)
- 46. System, fire extinguisher.**—(Usually on ordnance vehicles.)
- 47.**
- 48.**

Hoist vehicle (if practicable)

(except full-track and rear end of half-track vehicles)

- 49. Axle, front** (“Dead”—I-beam or tubular type.)
 - a.* Look at the front axle under the front of vehicle.
 - b.* Inspect axle for straightness.
 - c.* Shake right front wheel to check looseness of spindle. (This is difficult to do unless vehicle is jacked up or hoisted.)
 - d.* Go to left front wheel and inspect by shaking it to check spindle.
- 50. Axle, front (driving or “live”), lubrication.**—Same as Item 51.
- 51. Axle, rear.**
 - a.* Look under the rear of the vehicle at the rear axle.
 - b.* Inspect for cracks and oil leaks around cover.
 - c.* Inspect for bent brake shields at each end of axle.
 - d.* Test all nuts with wrench.
- 52. Axle, rear (driving), lubrication.**—See Item 51.
 - a.* Inspect all fittings for proper lubrication. Have excess lubricants wiped off clean.
 - b.* Remove plug from center of rear axle cover and check oil in housing. (Oil should be level with this plug.)
- 53. Body, bolts.**
 - a.* Bolts are located along each side of body at frame and sills.
 - b.* Test with wrench to see that all nuts are drawn up tight.
- 54. Engine, side pans.**
 - a.* Pans are located along each side of engine between engine and frame.
 - b.* Inspect for cleanliness. Shake to determine looseness.

55. Frame, distortion.

Inspect both side members and all cross members of frame for distortion and fractures.

56. Frame, rivets.

Inspect all rivets in frame, paying particular attention to the spring brackets, steering bracket, and engine support brackets.

57. Joints, universal.

a. The universal joints are usually parts of propeller shaft and located near the transmission and rear axle.

b. Test all bolts, check for lubricant leaks, and test joint for tightness. (Unless lubricated from some other unit or by packing, universal joints are lubricated with a grease gun.)

58. Lines, brake (hydraulic air).—Check for leaks, breaks, and loose connections.**59. Linkage, brake (mechanism).**

a. While under vehicle, inspect all brake rods that run to front and rear axles for looseness, indications of unusual wear, or signs of metal breaking, or tearing apart. Include clevis pins and cotter pins.

b. Check clevis pins to see that linkage is free and oiled.

60. Linkage, steering.

a. Inspect steering gear (or Pitman) arm, steering knuckle gear rod arm (or drag link), steering knuckles, and steering knuckle tie rod for lubrication and looseness of parts.

b. Be sure the drag link ends are serviceable and secured properly so that they will not come apart.

c. Test all nuts with wrench. Be positive that they are secure. All locking devices must be properly installed. (This is vital to safety.)

61. Shafts, propeller.

a. These shafts, when inclosed in a torque tube on a vehicle, can only be tested by dismantling or operating the vehicle. Defects are indicated by unusual or heavy thumping noises.

b. If open type, inspect for distortion and fractures.

62. Springs, front assembly.

a. Inspect front springs for broken leaves, leaves out of line, and loose clips and worn shackles.

b. Test all bolts with wrench.

c. Check for lubrication; have excess removed.

63. Springs, rear assembly.

a. Inspect rear springs for broken leaves, leaves out of line, worn shackles.

- b. Test all bolts with wrench.
 - c. Check for lubrication; have excess wiped off.
- 64. Shock absorbers, fill.**
- a. Shock absorbers are usually located on the frame at both right and left sides over the front and rear axles.
 - b. Remove the plug in the body of the shock absorber and check the fluid level. Fluid should be on a level with the plug.
 - c. The front and rear shock absorbers should be checked in a similar manner.
 - d. The rear shock absorbers may be located inside the side members of the frame. (It is difficult to check fluid level of a shock absorber unless the vehicle is on a level spot and the absorbers are secured in place.)
- 65. Tank, air.**
- a. Check for water condensation inside tank by opening petcock. Leave it open until water mist is replaced by air stream.
 - b. Inspect tank and air line connections for corrosion, rust, and leaks.
- 66. Transfer case-sub-transmission.—See Items 68 and 69.**
- 67. Transfer case-sub-transmission, lubrication.—See Items 68 and 69.**
- 68. Transmission.**
- a. The transmission, as a rule, is attached to rear of engine.
 - b. Inspect for leaks and cracked case.
 - c. Test all bolts with wrench.
 - d. Check all units driven off the transmission in a similar manner. (See Items 66 and 67.)
- 69. Transmissions, lubrication.**
- a. The filler plug is usually located at about the center of the forward right side of the transmission case.
 - b. Unscrew and remove plug; check oil, which should be level with this filler plug.
 - c. Check all units driven off the transmission in a similar manner.
- 70. Wheels, front, adjustment and trueness.**
- In order to check this properly, the front wheels must be raised off the ground.*
- a. Shake wheels to note excessive play in bearings.
 - b. Turn wheels and observe if they wobble. This is a check of trueness.
 - c. Lubrication fittings should be inspected.
 - d. Check all wheel nuts with wrench.

71. Wheels, front, lubrication.

Remove hub caps with wrench, and check grease pack in wheel bearings.

72. Wheels, rear.

In order to check this properly, the rear wheels must be raised off the ground.

- a. Shake wheels to note excessive play in bearings.
- b. Turn wheels to observe if they wobble. This is a check of trueness.
- c. Lubrication fittings should be inspected.
- d. Check all wheel nuts with wrench.

73.

74.

75.

Internal inspection (start engine)

76. Ammeter.

- a. The ammeter is usually located on the instrument panel on the dash board inside the cab.
- b. Check charging rate, which should read at maximum about 15 amperes, for 3d brush regulation, and 25 amperes for voltage regulation. (Proper charging rate indicates generator is functioning correctly.)

77. Accelerator.

- a. The accelerator is located on floor board inside cab.
- b. Check for proper alinement and freeness of action.

78. Choke.

- a. The choke is usually located on the instrument panel on the dash board inside the cab.
- b. Check for proper action and freeness of action.

79. Cut-Out.—Does not usually apply to military motor vehicle except on a motorcycle.

Check for loose parts and freedom of movement.

80. Extinguisher, fire.

- a. The fire extinguisher is usually located in a corner of the cab.
- b. Inspect to see that extinguisher is fully charged and tag properly filled out. See that bracket is tight and serviceable.

81. Filter, transmission oil.—(Usually on ordnance vehicles.)**82. Gage, air.**—Check for proper operation.**83. Gage, fuel.**

- a. The fuel gage is usually located on the instrument panel of the dash board.
- b. Inspect for proper reading while ignition switch is on. If in tank, check in similar manner.

84. Gage, oil.

- a.* The oil gage is usually located on instrument panel of dash board.
- b.* Check for proper reading, which should be from 5 with engine idling, to 25 to 40 with engine at full speed.

85. Generator.

Inspected while inspecting ammeter. (See Item 76.)

86. Horn.

Press button on steering wheel to determine if horn sounds.

87. Indicator, heat.

- a.* The heat indicator is located on the instrument panel of the dash board.
- b.* Check with motor running to determine if gage indicates rise in temperature.

88. Insulation, hull.—(Usually on ordnance vehicles.)**89. Lights.**

Inspected under Item 17.

90. Pad, protecting.—(Usually on ordnance vehicles.)**91. Protector, peep hole.—(Usually on ordnance vehicles.)****92. Pump, priming.—(Usually on ordnance or special vehicles.)****93. Seats, troop.**

Inspected on Item 4.

94. Starting motor.—Should be inspected with Item 99.**95. Switch, battery.—(Usually on ordnance vehicles.)****96. Switch, ignition.**

- a.* Ignition switch is located on instrument board.
- b.* It was inspected under Item 76.

97. Switch, meshing starter.—(Usually on ordnance vehicles.)**98. Switch, solenoid starter.—(Usually on ordnance vehicles.)****99. Switch, starter.**

- a.* The starter switch is usually located on floor board, sometimes on the dash.
- b.* Close starter switch and note starter action.

100. Tachometer.—(Usually on ordnance vehicles.)**101. Tools.**

Should be inspected for appearance, quantity, and condition.

102. Throttle.

- a.* The throttle, as a rule, is located on the instrument board.
- b.* Pull out and push back to determine that it works properly.

103. Upholstery.

Inspect upholstery for tears, cleanliness, broken internal springs, broken frame, and other unserviceable conditions.

104. Wiper, windshield.

- a. Operate switch or button on windshield wiper control and observe windshield wiper operation.
- b. Inspect hose or wiring connections.

105. Viscometer.

Check for proper functioning.

106. Voltmeter.—(Usually on ordnance vehicles.)**107.****108.***Hood up (engine running)*

(Raise both sides of hood and block them up or remove hood.)

109. Engine noise.

Accelerate engine sharply and listen for knocks and peculiar or unusual noises.

110. Engine, smoothness.

Accelerate engine slowly to different speeds and check smoothness of running.

111. Engine mounting.

Inspect front and rear engine mounting to determine that they are secure.

112. Gaskets (all).

- a. Inspect all gaskets on left side of engine for leaks.
- b. Inspect all gaskets on right side for leaks.

113. Leaks, fuel.

- a. Inspect fuel pump for gas leaks.
- b. Inspect carburetor for gas leaks.
- c. Inspect all lines running to and from carburetor for gas leaks.

114. Leaks, oil.

- a. Inspect valve covers of engine (and push rod cover when used) for oil leaks.
- b. Look under vehicle and see if any oil is dripping to the ground.

115. Leaks, water.

- a. Inspect hose connections to radiator and water pump for leaks.
- b. Examine radiator for leaks.

116. Valves, noise.

Listen carefully for an excessive valve noise at this time.

117. Wiring, ignition.

Inspect wires from distributor to spark plugs.

118. Wiring, other.

- a. Inspect wires at starter.
- b. Inspect headlamp and generator wires running inside of frame.

- c. Inspect taillamp wires running inside frame.
- d. Inspect wiring under instrument board in cab.

119.

120.

121.

*Road test vehicle***122. Body, noise.**

Listen for any unusual body noises, squeaks, or rattles. Determine location by direction, or stop vehicle and investigate to determine location, verifying by checking the suspected part.

123. Brakes, hand (or parking).

Test by pulling on the hand brake lever and judging the stopping distance. Note the ability of the brakes to "kill" the engine. Note any unusual noises or signs of loose parts.

124. Brakes, service.

Test by applying the service brake pedal (or for air brakes when required by use of service air brake control lever). Judge effectiveness of the brakes by stopping ability or ability to "kill" the engine.

125. Brakes, steering.

Usually found on ordnance vehicles only. (Applies to full-tracked vehicles as a rule.)

126. Clutch.

- a. Check for smoothness of operation.
- b. Check for effectiveness by setting the hand brake or using the foot brake, putting the vehicle in low gear, and releasing the clutch pedal slowly. If the clutch is effective and efficient, the action usually should "kill" the engine.

127. Drive units, noise.

- a. Listen to the transmission and transfer case action, particularly for a high pitched whine or a squeal which indicates internal misalignment or maladjustment.
- b. In shifting gears, it is usual for the two lower speeds to be much noisier in operation than high gear.
- c. Unusual noises in the transmission when operating in the higher gears should be investigated immediately to avoid severe damages.

128. Engine, noise.

- a. Certain light clicking or tapping noises usually indicate incorrect adjustment of tappets.
- b. Heavy thumping noises usually indicate engine bearing trouble.

- c.* Squeals and squeaks usually indicate loose fastenings or lack of lubrication in the generator, water pump, distributor, and similar small units operating at high speed.
- 129. Engine, misfiring.**
Can easily be detected by an experienced driver and is usually indicated by jerky motion of the vehicle or by other signs that indicate that a cylinder is misfiring or failing to develop full power.
- 130. Engine, lack of power.**
Can usually be detected by an experienced driver while operating the vehicle up hill or under load. Lack of power normally requires shifting from the high range of speed gears to the lower ranges.
- 131. Gear shift.**
Check to see that the gear shift lever is firmly fastened in its retaining socket and that the gear shift fork on the lower end of the lever moves properly through all gear changes selected.
- 132. Governor.**
- a.* Always inspect the governor for any indication of the seal having been broken or tampered with. (See Item 39.)
 - b.* If the governor housing shows any external signs of tampering, it usually means that the internal mechanism is in need of adjustment or repair.
- 133. Shock absorbers.**
- a.* Check the tightness with which the shock absorbers are fastened to the frame and axle.
 - b.* Check shock absorbers for liquid content, if hydraulic, and see that the level required by the manufacturer is maintained.
- 134. Speedometer.**
- a.* Check speedometer visually as to whether or not it is registering the speed of the vehicle and the miles of travel.
 - b.* Feel speedometer cable conduit. If hot, internal friction is developing due to some maladjustment. If a slight click or thump can be heard, the speedometer cable should be removed and inspected for distortion, incorrect length or diameter or for breaks.
- 135. Steering mechanism.**
- a.* While on the road, note if the steering wheel has a tendency to jerk. This indicates a looseness in the steering mechanism connection from the front axle to the wheel, or an error in steering geometry.

b. Note any tendency on the part of the vehicle to wander (or dive) to the right or left. This indicates a maladjustment or error in steering gear geometry.

c. If a thump or knocking is felt in the steering wheel, it indicates a loose part, usually in the steering gear worm.

136.

137.

138.

139.

140.

MOTOR TRANSPORT INSPECTIONS

APPENDIX II

OUTLINE OF INSPECTION PROCEDURE
FOR HIGHER COMMANDERS

Organization----- Date-----

Station-----

References: AR 850-15 and Circular 1-10, OQMG, current series.

	Yes	No
Operation		
1. Are vehicles being used properly?-----		
2. Is number of accidents reasonable? (If negative, a special check and report should be made)-----		
3. a. Are vehicles pooled for use?-----		
b. Are drivers regularly assigned to vehicles?-----		
4. Is there an adequacy of number and types of vehicles?-----		
5. Are all vehicles inspected as required by existing regulations?-----		
Inspection		
6. Are technical inspections made by qualified personnel?-----		
7. Are repaired vehicles "road tested" and checked before they are released to operating personnel?-----		
8. Are inspections thorough and complete?		
9. Do inspections constantly provide for "safe operations"?-----		
Maintenance		
10. Are vehicles lubricated properly?-----		
11. Are lubricating equipment and facilities adequate?-----		
12. Are proper lubricants being used?-----		
13. Is a lubrication schedule and record maintained?-----		
14. Are the repair shop and its facilities adequate?-----		
15. Are mechanics qualified and satisfactorily supervised?-----		
16. Are tools and shop equipment suitable?-----		
17. Are tools, parts, and equipment protected from theft, damage, etc.?-----		
18. Are required repair parts furnished promptly?-----		
19. Are repairs to private vehicles being made?-----		

QUARTERMASTER CORPS

	Yes	No
Records		
20. Are the vehicle service records (W.D., Q.M.C. Form No. 248) kept properly?		
21. Is the daily dispatching record (W.D., Q.M.C. Form No. 254) kept properly?		
22. Is driver's trip ticket (W.D., Q.M.C. Form No. 237) completed and submitted properly?		
23. Are gasoline and lubricant issue slips used properly?		
24. Do all drivers carry U. S. Army Motor Vehicle Operator's Permit (W.D., Q.M.C. Form No. 228)?		

Recommendations

.....

.....

Remarks

.....

.....

.....
Inspector

MOTOR TRANSPORT INSPECTIONS

APPENDIX III

ABBREVIATED OUTLINE OF INSPECTION PROCEDURE
FOR ORGANIZATION COMMANDERS

USA Reg. No. _____

Make _____ Model _____

Speedometer reading _____ Date _____

Item	Check if O. K.; cross if no good	Remarks or defects noted	Date defect cor- rected
<i>Routine</i>			
Bumpers and tow hooks. (Loose, broken, or bent) _____			
Winches and body hoists. (Appearance and condition) _____			
Engine and governor. (Condition, appearance, and noises.) (Governor seals) _____			
Cooling system. (Radiator grill guard, fan, and belt, hose) _____			
Fuel system. (Tank, lines, pump, and con- nections) _____			
Lubrication system. (Pump, gage, and lines) _____			
Ignition system. (Distributor, rotor, wires, and plugs) _____			
Starting and lighting system. (Starter, generator, cables, wir- ing, and battery) _____			
Front axle assembly. (Tie rod, springs, seats, leak- age, and wheels) _____			
Transmission, transfer case, and universals. (Leakage, loose parts, lubrica- tion) _____			
Rear axle assembly. (Springs, seats, leakage, and wheels) _____			
Frame. (Alinement, loose rivets, and shackle plates) _____			

QUARtermaster CORPS

Item	Check if O. K.; cross if no good	Remarks or defects noted	Date defect cor- rected
Body, fenders, and hood. (Appearance and condition)-----			
Tarpaulin, bows, ridge, and canvas. (Tears, seam rips, and ropes)-----			
Safety			
Steering. (Linkage, unusual play, and noises)-----			
Brakes. (Proper functioning, leakage, hydraulic cylinders, leaks, and air lines)-----			
Tires. (Cuts, tears, blisters, treadwear, and proper inflation)-----			
Lights. (Switches, head, tail, stop, directional, and side)-----			
Horn. (Wiring, button, and sound)-----			
Mirror and reflectors. (Sides and rear)-----			
Fire extinguisher. (In place and filled)-----			
General conditions			
Lubrication-----			
Appearance-----			
Tools and equipment-----			

Remarks-----

Inspector

MOTOR TRANSPORT INSPECTIONS

APPENDIX IV

HARD STARTING

(One or more of the following may cause hard starting.)

- Battery test**----- electrolyte level OK-----low-----battery dirty-----
 loose in cradle-----cracked case-----seepage-----
 Hydrometer reading each cell-----should be 1.280-----
 cranking test with lights on—OK-----
 lights dim excessively and engine cranks slowly-----
- Battery cables**----- OK-----corroded-----free from grounds-----
 terminals—OK-----corroded-----dirty-----tight-----
 ground strap—OK-----connection to frame-----
- Starter**----- cranking voltage at starter-----at switch-----
 condition of commutator-----
 condition of brushes-----spring tension-----
 condition of brush leads-----condition of bearings-----
 Bendix drive-----
- Spark plugs**----- Type OK-----mileage-----dirty-----burned-----gap-----
- Ignition**----- contact points OK-----pitted-----burned-----dirty-----gap-----
 condenser OK-----shorted-----open-----leaky-----
 distributor shaft OK-----automatic advance OK-----stuck-----
 timing OK-----late-----early-----
 distributor voltage—points closed-----points opened-----
 ignition cables OK-----cracked-----leaky-----oil soaked-----
 grounded-----
- Coil**----- in-put voltage-----out-put spark (length)-----
 ground-----switch OK-----contacts OK-----
- Carburetor**----- gaskets OK-----throttle shaft-----
 choke OK-----heat control valve-----
 manifold OK-----gaskets-----bolts-----
 governor OK-----stuck-----
- Oils**----- transmission and engine oil—OK-----
 Does driver disengage clutch when trying to start engine
 especially in cold weather-----

QUARTERMASTER CORPS

APPENDIX V

SLUGGISH MOTOR

(One or more of the following may cause a sluggish motor)

Ignition

Points.....	pitted.....	burned.....	lined up.....
	gap.....	spring tension.....	voltage.....
Automatic advance..	stuck.....	too loose.....	excess play.....
Distributor shaft..	worn.....		
Cap.....	corroded.....	cracked.....	burned.....
Rotor.....	loose.....	burned.....	cracked.....
Cables.....	leaky.....	corroded.....	cracked.....
Condenser.....	shorted.....	open.....	leaky.....
Coil.....	in-put voltage.....	out-put (length).....	
	should be.....	correct type.....	size.....

Carburetor

Choke.....	fully opens.....	fully closes.....
Throttle shaft.....	worn.....	sticky.....

	<i>Carburetor adjust- ment, rich or lean</i>	<i>Vacuum reading</i>	<i>Should be about— (inches)</i>
Idle.....			20.
20 miles per hour.....			19 to 20.
35 miles per hour.....			19 to 20.
50 miles per hour.....			18½ to 19.

Governor.....	OK.....	
Air cleaner	clogged.....	bent.....
Fuel pump	strainer.....	pressure.....
		gaskets.....
		dirt under valves.....
Vacuum tank	suction.....	connections.....
		gaskets.....
Spark plugs	cracked.....	spaced.....
		burned.....
		dirty.....
		mileage.....
Compression	No. 1 cylinder.....	No. 2 cylinder.....
	No. 4 cylinder.....	No. 5 cylinder.....
	No. 7 cylinder.....	No. 8 cylinder.....
Valves	burned.....	sticky.....
		leaky.....
		adjusted.....
Timing chain.....	loose.....	jumped.....
Oil	too heavy.....	too light.....
Brakes	dragging.....	free.....
Clutch	grabs.....	slips.....

MOTOR TRANSPORT INSPECTIONS

APPENDIX VI
 RUN-DOWN BATTERY

(One or more of the following may cause a run-down battery)

Battery	Make certain that no circuits were left closed with vehicle not in use. Electrolyte level OK.....low.....seepage.....dirty.....loose in cradle.....case cracked.....
Battery test	Hydrometer reading each cell.....should be 1.280.....cranking test with lights on—OK.....lights dim excessively and engine cranks slowly.....
Battery cables	corroded.....terminals dirty.....tight.....ground connection.....insulation.....
Starter	voltage (cranking).....condition of armature.....brushes.....brush leads.....spring tension.....
Generator	charging rate (m. p. h.).....should be.....reaches maximum at approximately what speed.....condition of commutator—OK.....out of round.....scored.....rough.....high insulation.....throwing solder.....brushes.....brush spring tension.....
Cut-out	closes.....does cut-out open when generator stops charging.....condition of points.....

Current draw test for short circuits

(Use ammeter in circuit at battery terminals)

All electrical units

Headlights*.....	Ignition, engine off.....
Parklights*.....	Ignition, engine idling.....
Stoplights.....	Heater.....
Taillights and panellights*.....	Horns.....
Other units.....

*In making tests, various circuits should be separated.

QUARTERMASTER CORPS

APPENDIX VII
POOR MILEAGE

(One or more of the following may cause poor mileage.)

Carburetor	type.....	correct for engine.....	
			<i>Carburetor adjustment, Rich or lean</i>
			<i>Vacuum, Should be about— (inches)</i>
Idle.....			20.
20 miles per hour.....			19 to 20.
35 miles per hour.....			19 to 20.
45 miles per hour.....			18 to 19.
55 miles per hour.....			18 to 19.
Governor.....	OK.....	stuck.....	
Choke.....	opens completely.....	loose.....	
Throttle shaft.....	worn.....	tight.....	
Gaskets.....	leaky.....	Throttle spring—tight.....	loose.....
Air cleaner	clogged.....		
Ignition			
Points.....	gap.....	alinement.....	
Condenser.....	Test OK.....	shorted.....	leaky..... open.....
Coil.....	Tests.....	primary current, engine cut off (points closed).....	
		primary current, engine idling.....	out-put spark (length).....
Ignition cable.....	corroded.....	cracked.....	old.....
		oil soaked.....	leaky on test.....
Timing.....	late.....	early.....	Automatic advance—OK..... stuck.....
Distributor shaft.....	side play.....	worn.....	
Cam lobes.....	worn.....		
Spark plugs	test.....	cracked.....	burned..... dirty..... gap—OK.....
Motor compression	No. 1 cylinder.....	No. 2 cylinder.....	No. 3 cylinder.....
	No. 4 cylinder.....	No. 5 cylinder.....	No. 6 cylinder.....
	No. 7 cylinder.....	No. 8 cylinder.....	
Valves	sticky.....	burned.....	leaky..... tappet adjustment.....
Brakes	dragging.....	free.....	
Clutch	slipping.....	grabs.....	
Miscellaneous	tire pressure OK.....	low.....	Oil OK..... too heavy.....

MOTOR TRANSPORT INSPECTIONS

APPENDIX VIII

OVERHEATING

(One or more of the following may cause overheating)

Radiator	clogged.....	leaky.....
Thermostat	opens properly.....	stuck.....
Motor block	clogged.....	rust bound.....
	side plate rusty.....	leaky.....
		gasket.....
Hoses	leaky.....	soft.....
		worn.....
Fan	bearings tight.....	blades loose.....
Belt	loose.....	worn.....
Ignition	timed correctly.....	late.....
	missing.....	early.....
		automatic advance.....
Valves	timed correctly.....	late.....
	leaky.....	early.....
	sticky.....	burned.....
		adjusted.....
Timing chain	loose.....	jumped.....
Brakes	dragging.....	
Motor oil	too light.....	too heavy.....
Water pump	leaking.....	worn.....
		correct grease.....
Muffler	clogged.....	OK.....

APPENDIX IX

BATTERY INSPECTION RECORD

NOTE: Fully charged.....() Specific gravity 1.280-1.300.
 Half charged.....() Specific gravity 1.220.
 Discharged.....() Specific gravity 1.150 or lower.

Battery or vehicle number	Readings		Defects noted	Corrective action
	Hydrom-eter	Volts		

When inspection is completed the inspector will initial below.
 See reverse side for instructions on battery inspection. _____ Inspector.
 _____ Date.

Instructions

1. Test each cell with hydrometer before adding water to determine specific gravity. If specific gravity falls below 1.220, battery should be recharged.
2. Clean all terminals and apply a coat of vaseline.
3. Clean top of battery.
4. Tighten all screws, bolts, etc., to secure battery properly.
5. Clean battery box. If necessary, paint with asphaltum.
6. Inspect battery cables. Repair or replace if necessary.
7. If the battery tester furnished with Unit Set No. 2 is available, it should be used across the terminals of each cell and the reading of

MOTOR TRANSPORT INSPECTIONS

the voltmeter noted. If this reading is less than 1.8 volts, it is a reasonable indication that the cell is defective and that further detailed examination should be made by a battery specialist. This test is usually a 20-ampere discharge test.

APPENDIX XII

CONTINUOUS RECORD OF PREVENTIVE MAINTENANCE
FOR EACH VEHICLE

Truck No. W-.....	Mileage brought forward	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Battery (date only)												
Lubricate chassis													
Engine—Crankcase													
— Oil filter													
— Air cleaner													
— Air compressor													
— Generator													
— Starter													
— Governor													
— Distributor													
Clutch													
Transmission													
Transfer case													
Universals and support bearings													
Propeller shaft													
Differentials													
Shock absorbers													
Springs													
Wheel bearings													
Steering gear													
Front axle universals													
Winches and hoists													

NOTE: This form is intended only as a general guide and is not complete in all details for any one specific model or make of vehicle. If adopted for local use, it should be amended and developed according to local requirements, according to manufacturer's manual.

[A. G. 062.11 (4-18-40).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

E. S. ADAMS,
*Major General,
The Adjutant General.*

